WHAT IS CLAIMED IS:

1. A rotary electric machine comprising a stator having a stator core wounded with stator windings; and a rotor having a rotor core rotatable and opposite to said stator core through a gap, wherein

said rotor core comprises a plurality of projecting poles arranged in a side of said gap and along the circumferential direction; and a plurality of rotor yokes for forming a magnetic path conducting magnetic fluxes of each of said projecting poles, and said rotor core is divided in the circumferential direction in a unit of each of said projecting poles and each of said rotor yokes opposite to each of said projecting poles.

2. A rotary electric machine according to claim 1, wherein a position of said division is at each middle position of width in the circumferential direction of said projecting poles.

3. A rotary electric machine comprising a stator having a stator core wounded with stator windings; and a rotor having a rotor core rotatable and opposite to said stator core through a gap, wherein

said rotor core comprises a plurality of permanent magnets arranged and embeded therein in a side of said gap and along the circumferential direction; and a plurality of rotor yokes for forming a magnetic path conducting magnetic

fluxes of each of said permanent magnets, and said rotor core is divided in the circumferential direction in a unit of each pole of said permanent magnets and each of said rotor yokes opposite to each pole of said permanent magnets.

4. A rotary electric machine according to claim 3, wherein a position of said division is at each position between the poles of said permanent magnets.

5. A rotary electric machine according to any one of claim 1 and claim 3, wherein said rotor core is made of a different material from a material of said stator core.

6. An electric vehicle comprising a battery for supplying electric power; a rotary electric machine for outputting drive torque to drive the vehicle by said supplied electric power; and a controller for controlling said drive torque, wherein

said rotary electric machine comprises a stator having a stator core wounded with stator windings; and a rotor having a rotor core rotatable and opposite to said stator core through a gap, and said rotor is formed of a rotor core divided in the circumferential direction in a unit of each magnetic pole and a holding member having an I-shaped cross section for holding said rotor core, said holding member having an I-shaped cross section being disposed an inner peripheral side of said rotor core in

order to lengthen a driving distance per charge of said vehicle by reducing the vehicle weight.

7. A permanent magnet rotary electric machine comprising a stator having a stator core wounded with stator windings; and a rotor having a rotor core opposite to said stator core through a rotation gap, a plurality of permanent magnets being arranged and embeded in said rotor core in the circumferential direction, wherein

the following relation is satisfied,

$r/w \fallingdotseq 0.6 \pm 0.1$,

where r is a distance in a radial direction from an inner radial surface of said rotor core to a side end portion between poles of an inner peripheral surface of each of said permanent magnets, and $2 \cdot w$ is a length in the circumferential direction of said permanent magnet.

8. A permanent magnet rotary electric machine comprising a stator having a stator core wounded with stator windings; and a rotor having a rotor core opposite to said stator core through a rotation gap, a plurality of permanent magnets being arranged and embeded in said rotor core in the circumferential direction, said rotor core having a plurality of die-cut holes in the circumferential direction between an inner radial surface of said rotor core and an inner peripheral surface of said permanent magnets, wherein

the following relation is satisfied,

$$t/w \fallingdotseq 0.6,$$

where t is a distance in a radial direction from said permanent magnet side of each of said die-cut holes to a side end portion between poles of an inner peripheral surface of each of said permanent magnets, and $2 \cdot w$ is a length in the circumferential direction of said permanent magnet.